

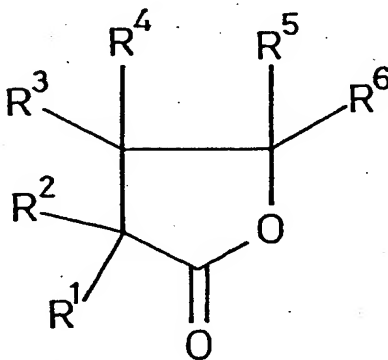
# CLAIMS

1. A non-aqueous electrolyte secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolyte,

said non-aqueous electrolyte comprising a non-aqueous solvent and a solute dissolved in said non-aqueous solvent,

said non-aqueous solvent comprising: (A) a cyclic carboxylic acid ester; (B) a cyclic carbonic acid ester having at least one carbon-carbon unsaturated bond; and (C) a cyclic carbonic acid ester having no carbon-carbon unsaturated bond.

2. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said cyclic carboxylic acid ester (A) is at least one selected from the group consisting of  $\gamma$ -butyrolactone and a derivative of  $\gamma$ -butyrolactone represented by the formula (1):



where R<sup>1</sup> to R<sup>6</sup> are, independently, a hydrogen atom, a halogen atom, an alkyl group having 1 to 6 carbon atoms, or

an acetyl group having 1 to 6 carbon atoms.

3. The non-aqueous electrolyte secondary battery in accordance with Claim 2, wherein said derivative of  $\gamma$ -butyrolactone is  $\gamma$ -valerolactone.

4. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said cyclic carbonic acid ester having at least one carbon-carbon unsaturated bond (B) is at least one selected from the group consisting of vinylene carbonate, vinylethylene carbonate and divinylethylene carbonate.

5. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said cyclic carbonic acid ester having no carbon-carbon unsaturated bond (C) is at least one selected from the group consisting of propylene carbonate, ethylene carbonate and butylene carbonate.

6. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said cyclic carboxylic acid ester (A) is at least one selected from the group consisting of  $\gamma$ -butyrolactone and  $\gamma$ -valerolactone, said cyclic carbonic acid ester having at least one carbon-carbon unsaturated bond (B) is at least one selected from the group consisting of vinylene carbonate, vinylethylene carbonate and divinylethylene carbonate, and said cyclic carbonic acid ester having no carbon-carbon unsaturated bond (C) is at least one selected from the group consisting of propylene carbonate and ethylene carbonate.

7. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said non-aqueous solvent comprises vinylene carbonate and vinylethylene carbonate as said cyclic carbonic acid ester having at least one carbon-carbon unsaturated bond (B).

8. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said non-aqueous solvent further comprises a linear carbonic acid ester (D).

9. The non-aqueous electrolyte secondary battery in accordance with Claim 8, wherein said linear carbonic acid ester (D) is at least one selected from the group consisting of dimethyl carbonate, ethylmethyl carbonate and diethyl carbonate.

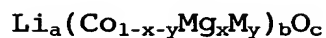
10. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said non-aqueous solvent further comprises a glime (E).

11. The non-aqueous electrolyte secondary battery in accordance with Claim 10, wherein said glime (E) is at least one selected from the group consisting of diglime, triglime and tetraglime.

12. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said positive electrode comprises a lithium-containing transition metal oxide and said negative electrode comprises graphite.

13. The non-aqueous electrolyte secondary battery in accordance with Claim 12, wherein said lithium-containing

transition metal oxide is represented by the formula:



where M is at least one selected from the group consisting of Mn, Ni, Y, Yb, Ca, Al, Ti, Cu, Zn, Sr and Ba,  $0 \leq a \leq 1.05$ ,  $0.005 \leq x \leq 0.15$ ,  $0 \leq y \leq 0.25$ ,  $0.85 \leq b \leq 1.1$  and  $1.8 \leq c \leq 2.1$ .

14. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said non-aqueous electrolyte comprises  $\text{LiPF}_6$  and  $\text{LiBF}_4$  as said solute.

15. The non-aqueous electrolyte secondary battery in accordance with Claim 1, wherein said non-aqueous solvent further comprises a derivative of benzene comprising a phenyl group and a cyclic compound group contiguous to said phenyl group.